

# PATENT ABSTRACTS OF JAPAN

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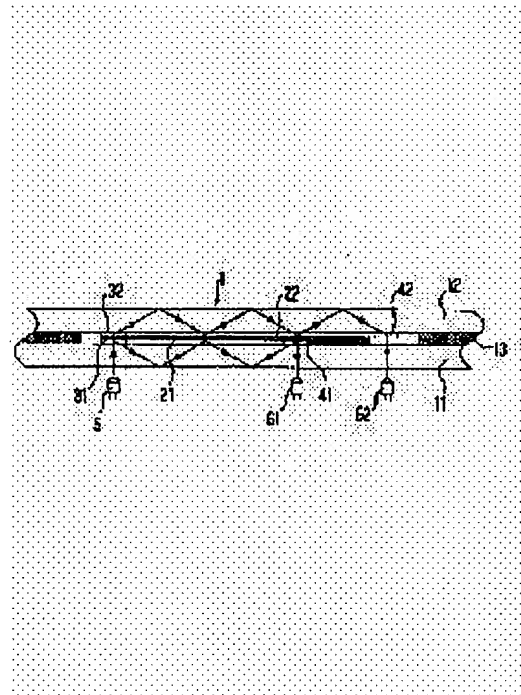
## (54) DEVICE FOR DETECTING RAINDROP AND DEW CONDENSATION

### (57)Abstract:

PROBLEM TO BE SOLVED: To enable raindrops and dew condensation to be accurately detected without interfering with the field of view of a driver, by detecting totally reflected light in sheet glass inside and outside a vehicle due to first and second holograms provided for laminated glass by light receiving elements.

SOLUTION: An light emitting element 5 and light receiving elements 61 and 62 are mounted on a laminated glass, and it is mounted as a wind shield. Detection light from the light emitting element 5 is partially diffracted by a hologram 31, totally reflected to travel in the laminated glass inside a vehicle, partially transmitted to be incident on a hologram 32, diffracted, and totally reflected to travel in the laminated glass

outside the vehicle. When raindrops adheres to the laminated glass outside the vehicle, detection light is scattered to result in substantial reduction of detection light to be received by the light receiving element 62. When dew condensation occurs on the laminated glass inside the vehicle, detection light to be received by the light receiving element 61 is substantially reduced. By comparing the absolute amount of light reception of the light receiving element 62 with a reference value at the time of no rainfall and comparing the amount of light reception of the light receiving element 61 with a reference value at the time of no dew



condensation, it is possible to detect raindrops and dew condensation each accurately.

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#### LEGAL STATUS

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[Date of final disposal for application]

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[Date of requesting appeal against examiner's decision of rejection]

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

**[Drawing 1]** It is the important section cross section of the windshield in an example 1.

**[Drawing 2]** It is the important section cross section of the windshield in an example 2.

**[Drawing 3]** It is the important section cross section of the windshield in an example 3.

**[Drawing 4]** It is the important section cross section showing one embodiment of introduction of detection light.

**[Drawing 5]** It is the important section cross section showing one embodiment of introduction of detection light.

**[Drawing 6]** It is the important section cross section showing one embodiment of introduction of detection light.

**[Drawing 7]** It is the important section cross section showing one embodiment of introduction of detection light.

**[Description of Notations]**

1 Glass Laminate

2 Hologram for Total Reflection

3, 31, 32 Hologram for introduction

41, 42, 43, 44 Hologram for derivation

5, 51, 52 Light emitting device

61 62 Photo detector

7 Prism

8 One-way Mirror

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**[Translation done.]**

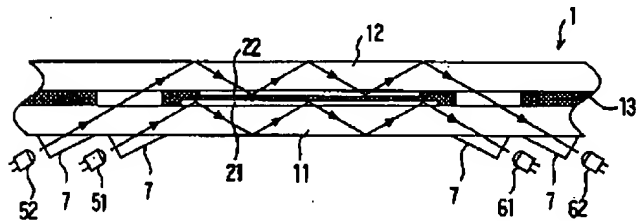
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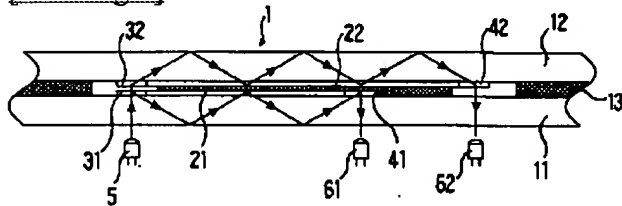
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## DRAWINGS

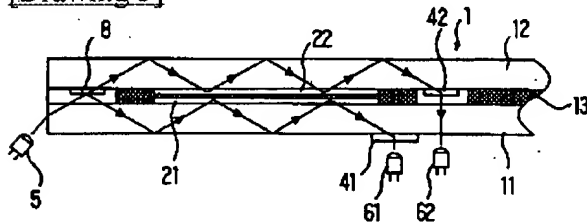
[Drawing 1]



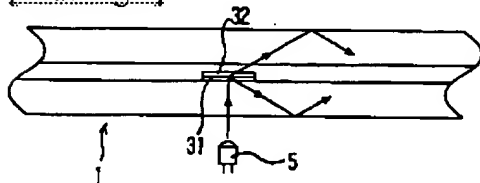
[Drawing 2]



[Drawing 3]

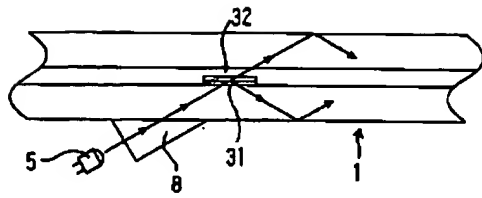


[Drawing 4]

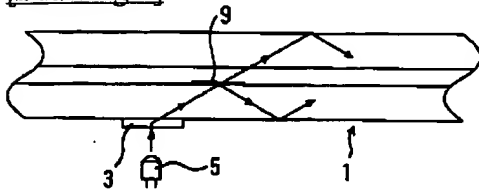


[Drawing 5]

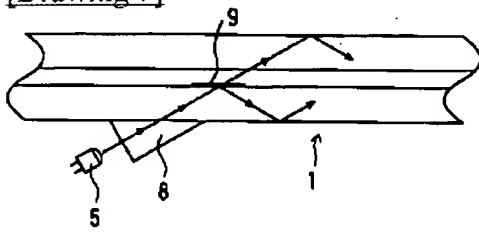




[Drawing 6]



[Drawing 7]



[Translation done.]